Claims:

1. An isolated, purified DYXC1 nucleic acid comprising SEQ ID NO:1 or a complement thereof; homologs and variants thereof, and fragments thereof.

2. The isolated nucleic acid according to claim 1, which is mammalian.

3. The isolated nucleic acid according to claim 2, which is human.

4. The isolated nucleic acid according to claim 1, wherein said nucleic acid hybridises under high stringency conditions to a nucleotide sequence of SEQ ID NO:1 or a complement thereof.

5. The isolated nucleic acid according to claim 4, wherein said high stringency conditions comprise 6 × NaCl/sodium citrate (SSC) at about 45 °C for a hybridisation step, followed by a wash of 2 × SSC at 50 °C.

6. The isolated nucleic acid according to claim 1, wherein said fragment is a primer or a probe hybridising specifically to a nucleic acid having the sequence of SEQ ID NO:1 or a complement thereof.

7. A vector comprising the nucleic acid of claim 1.

8. A host cell comprising the vector of claim 7.

9. An isolated nucleic acid molecule encoding DYXC1 amino acid sequence of SEQ ID NO:3.

10. An isolated DYXC1 nucleic acid comprising at least one single nucleotide polymorphism in any one of the following positions as defined by SEQ ID NO:1: 4 (C preferably to T), 271 (G preferably to A), 572 (G preferably to A), 1249 (G preferably to T), and 1259 (C preferably to G), or as defined by SEQ ID NO:2: 205 (C preferably to T), 366 (G preferably to A), and 367 (G preferably to A).

11. A method for the diagnosis of a single nucleotide polymorphism in *DYXC1* gene in a subject, which method comprises determining the sequence of the nucleic acid of the subject at one or more of positions 4, 271, 572, 1249 and 1259 in the *DYXC1* gene as defined in SEQ ID NO:1 and positions 205, 366, and 367 as defined in SEQ ID NO:2 and determining the status of the subject by reference to polymorphism in *DYXC1* gene.

12. The method according to claim 11, wherein the nucleic acid region containing the potential single nucleotide polymorphism is amplified by polymerase chain reaction prior to determining the sequence.

13. The method according to claim 11, in which the sequence is determined by a method selected from allele specific amplification, allele specific hybridisation, SSCP, oligonucleotide ligation assay and restriction fragment length polymorphism (RFLP).

14. The method according to any one of claims 11-13 for assessing the predisposition of an individual to dyslexia.

15. An allele-specific primer or probe capable of detecting a *DYXC1* gene polymorphism at one or more of positions 4, 271, 572 and 1249 in the *DYXC1* gene as defined in SEQ ID NO:1 and positions 205, 366, and 367 as defined in SEQ ID NO:2.

16. An isolated and purified *DYXC1* polypeptide comprising the amino acid sequence of SEQ ID NO:3 or splice variants thereof.

17. Method of producing a *DYXC1* polypeptide according to claim 16, said method comprising the steps of:
culturing a host cell of claim 8 comprising a polynucleotide encoding said polypeptide operably associated with a promoter sequence such that the nucleic acid sequence encoding said polypeptide is expressed; and
isolating said polypeptide from said host cell or from a growth medium in which said host cell is cultured.

18. Method of producing antibodies comprising:
- immunising a mammal with the isolated and purified *DYXC1* protein of claim 16 or an antigenic fragment thereof.

19. Use of the isolated and purified *DYXC1* protein of claim 16 or an antigenic fragment thereof as an antigen.

20. An antibody produced by the method of claim 18.

21. The antibody of claim 20 which is labeled with a detectable label.

22. A kit for use in the diagnostics of dyslexia or in assessing the predisposition of an individual to dyslexia, comprising
- a container; and in said container:
- a compound, preferably labeled, capable of detecting *DYXC1* gene or allelic variants thereof.

23. The kit according to claim 22, wherein said compound is a primer or probe.

24. The kit according to claim 22, wherein said compound is an antibody as defined in claim 20.

25. The kit according to claim 22 further comprising instructions for using the kit.

26. A method for identifying a mutant *DYXC1* nucleotide sequence in a suspected mutant *DYXC1* allele which comprises comparing the nucleotide sequence of the suspected mutant *DYXC1* allele with a wild-type *DYXC1* nucleotide sequence, wherein a difference between the suspected mutant and the wild-type sequence identifies a mutant *DYXC1* nucleotide sequence.

27. The method according to claim 26 wherein the sequence of said suspected mutant *DYXC1* allele is compared with the sequence of one or more wild-type *DYXC1* gene sequences selected from the sequences set forth in SEQ ID NO:1, SEQ ID NO:2,

SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:8, SEQ ID NO:9, SEQ ID NO:10 and wild-type allelic variants thereof.

28. The isolated nucleic acid according to claim 2, which is from a primate.

29. The isolated nucleic acid according to claim 28, wherein said nucleic acid is selected from the group consisting of sequences set forth in SEQ ID NOS:13, 15, 17 and 19.

30. An isolated and purified polypeptide comprising the amino acid sequence selected from the group consisting of sequences set forth in SEQ ID NOS:14, 16, 18, and 20.

31. A method of identifying a compound that modulates the expression of DYXC1, the method comprising:

(f) incubating a cell that can express DYXC1 gene with a compound under conditions and for a time sufficient required for the cell to express DYXC1 gene, when the compound is not present;

(g) incubating a control cell under the same conditions and for the same time without the compound;

(h) measuring expression of DYXC1 gene in the cell in the presence of the compound;

(i) measuring expression of DYXC1 gene in the control cell; and

(j) comparing the amount of expression of DYXC1 gene in the presence and absence of the compound, wherein a difference in the level of expression indicates that the compound modulates the expression of DYXC1 gene

32. A method of identifying a compound that modulates DYXC1 activity, the method comprising:

(f) incubating a cell that has said activity with a compound under conditions and for a time sufficient required for the cell to express said activity, when the compound is not present;

(g) incubating a control cell under the same conditions and for the same time without the compound;

(h) measuring said activity in the cell in the presence of the compound;

(i) measuring said activity in the control cell; and

(j) comparing the amount of said acitivity in the presence and absence of the compound, wherein a difference in the level of activity indicates that the compound modulates the activity of said gene

33. Method for affinity purification of a substance that binds to the DYXC1 comprising the following steps: a) contacting a source suspected to contain said substance with an immobilized DYXC1 under conditions whereby said substance to be purified is selectively adsorbed onto the immobilized DYXC1; (b) washing the immobilized DYXC1 and its support to remove non-adsorbed material; and (c) eluting said substance from the immobilized DYXC1 to which they are adsorbed with an elution buffer.